



# 352

RAE-B

LOWER ANTENNA DATA SUMMARY

73-039A-02B



RAE-B

LOWER ANT, DATA SUMMARY MAGTAPE

73-039A-02B

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED TWO 9-TRACK, 1600 BPI STANDARD LABEL TAPES WRITTEN IN BINARY. THERE IS ONE RESTORED NON-LABELLED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND THEY WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004324	DS004324	D024523 D024524	1 2	07/12/73 - 12/31/74 01/01/75 - 03/09/76

REQ. AGENT  
CMP

RAND NO.  
RC6459

ACQ. AGENT  
CDW

RAE-B

LOWER ANTENNA DATA SUMMARY

73-039A-02B

This data set consists of 2 RAE-B data tapes. They are written in Binary, are 9-track and have 1600 BPI. These tapes have a standard label format. The physical records are 32,336 bytes long. Listed below are the time spans, 'D' and 'C' numbers and number of files on each tape.

<u>'Z'</u>	<u>D#</u>	<u>C#</u>	<u>FILES</u>	<u>TIME SPANS</u>
0610	D-24523	C-18115	1	7/12/73 - 12/21/74
0611	D-24524	C-18116	1	1/01/75 - 3/09/76

RAE-2 EXPERIMENT DESCRIPTION

The Radio-Astronomy-Explorer-2 satellite (Explorer-49) was placed in an 1100 km, circular lunar orbit on 15 June 1973. The RAE-2 was instrumented with electric antennas and radio receivers designed to provide sensitive observations of nonthermal radio emissions from the sun, the planets, and the Milky Way at frequencies between 25 kHz and 13 MHz. This document describes the basic data base compiled from the RAE-2 radio receiver experiments. A detailed discussion of the objectives and instrumentation of RAE-2 is given in "Scientific Instrumentation of the Radio-Astronomy-Explorer-2 Satellite" by J.K. Alexander, M.L. Kaiser, J.C. Novaco, F.R. Grena, and R.R. Weber which was published as Goddard Space Flight Center Report X-693-75-40, Feb. 1975 (attachment 1) and which appeared in slightly condensed form under the same title in Astronomy and Astrophysics, vol. 40, pp. 365-371 (1975). Additional information can be obtained in papers listed in the Radio Astronomy Explorer Program Bibliography appended to this document (attachment 2). A list of important RAE-2 operations dates is given in Table 1, and a list of some pertinent experiment parameters is given in Table 2 and shown in Figure 1.

Table 1. Major RAE-2 Event Dates

Launch . . . . .	10 June 1973
Lunar orbit injection . . . . .	15 June 1973
Final orbit trim . . . . .	9 July 1973
V-antenna extension to 183m; experiment turn-on . . . . .	12 July 1973
First lunar shadow period . . . . .	29 July-26 Oct. 1973
Upper V-antenna extension to 200 m . .	8 Nov. 1973
Upper V-antenna extension to 229 m . .	14 Nov. 1973
Second lunar shadow period . . . . .	3 Jan-22 Mar. 1973
Third lunar shadow period . . . . .	10 June-28 Aug. 1974
One lower V-antenna boom extended to 229 m . . . . .	11 Oct. 1974
Other lower V-antenna boom extended to 229 m. . . . .	6 Nov. 1974
Fourth lunar shadow period . . . . .	17 Nov. 1974-1 Feb. 1975
Fifth lunar shadow period . . . . .	21 Apr.-9 Jul. 1975
Begin "new moon intensive" 50% data coverage . . . . .	1 July 1975
Resume full-time data coverage . . . . .	24 Dec. 1975
Return to 50% coverage during selected periods . . . . .	17 Apr. 1976
Resume full-time coverage . . . . .	19 Oct. 1976

**Table 2. Salient RAE-2 Experiment Characteristics**

**ORBIT**

Lunar altitude . . . . .	1058 x 1070 km
Inclination to lunar equator . . . . .	59°
Period . . . . .	222 min

**BURST RECEIVERS**

Frequency range . . . . .	0.025-13.1 MHz
Number of channels . . . . .	32
Sample rate . . . . .	1 sample / 7.68 sec at each frequency
Bandwidth . . . . .	20 kHz
Time constant . . . . .	6 ms
Dynamic range . . . . .	> 50 dB
Calibration accuracy (relative) . . . . .	±0.5 dB rms

**V-ANTENNAS**

Full length . . . . .	229 m
Apex angle . . . . .	approx. 35°

Table 2 (continued)

RYLE-VONBERG RECEIVERS

Frequency range . . . . .	0.450 - 9.18 MHz
Number of channels . . . . .	9
Sample rate . . . . .	
Coarse . . . . .	4 samples/7.68 sec at one frequency
Fine . . . . .	1 sample/7.68 sec at one frequency
Cycle Time . . . . .	138 seconds
Bandwidth . . . . .	40 kHz
Time Constant . . . . .	
Coarse . . . . .	0.1 sec
Fine . . . . .	0.5 sec
Dynamic range . . . . .	60 db
Calibration accuracy (relative)	$\pm$ 3%

### Burst Receivers

The RAE-2 burst receivers were 32-channel, stepped-frequency receivers which obtained one sample at each frequency every 7.68 sec. One receiver (BR-1) was connected to the upper V-antenna and one receiver (BR-2) was connected to the lower V-antenna. As shown in the accompanying block diagram (Figure 2) the RF voltage at the feed point of each half of the V-antenna was sampled by a wide-band, high-impedance pre-amplifier, and the pre-amplifier outputs were combined in a balun transformer and fed to the burst receiver. Each burst receiver was comprised of a pair of redundant IF amplifiers and detectors which shared a common set of crystal-controlled local oscillators and mixers. Only one IF strip was powered on at a given time; the other was used as a back-up system. Low-pass filters at the input of the burst receiver prevented strong signals at the 21.4 MHz intermediate frequency from entering the IF strip. Each receiver had a crystal-controlled IF bandwidth of 20 kHz and a post-detection integration time constant of 6 msec. A thermistor located in each burst receiver provided a measurement of the ambient temperature of the receiver, and this information was included in the housekeeping data telemetered every 19.7 min. Also, the normal antenna signal measurement sequence was interrupted for 1.28 min every 19.7 min, and calibration noise source signals were injected into each burst receiver to provide a check of their long term gain stability. The center frequencies for each burst receiver channel are listed in Table 3.

Table 3. RAE-2 Burst Receiver Frequencies

Ch.#	Freq.(kHz)	Ch.#	Freq.(kHz)	Ch.#	Freq.(kHz)	Ch.#	Freq.(kHz)
1	25	9	130	17	475	25	2200
2	35	10	155	18	600	26	2800
3	44	11	185	19	737	27	3930
4	55	12	210	20	870	28	4700
5	67	13	250	21	1030	29	6550
6	83	14	292	22	1270	30	9180
7	96	15	360	23	1450	31	11800
8	110	16	425	24	1850	32	13100

The total dynamic range of the burst receivers was approximately 60 dB and was divided into two 30-dB ranges by logic circuitry in the detector electronics. The least significant bit of each 8-bit telemetry word was used to provide a range flag. The limit of the input signal level resolution due to telemetry quantization step size was about 0.3 dB.

Saturation level signals at the pre-amplifier input often resulted in the generation of intermodulation products in the RF amplifiers which then appeared as wide-band signals in the telemetered data. This problem was most acute when intense kilometer wavelength emissions from the terrestrial magnetosphere were observed at frequencies in the 200-300 kHz range. BR-1 was less susceptible to intermodulation problems than BR-2 by 6 to 10 dB. An example of an event with significant intermodulation interference artifacts is shown in Figure 3.

Due to a failure in the local oscillator circuitry in BR-1, channels 4(55 kHz) and 12 (210 kHz) did not provide useable data.

During periods when a portion of each orbit was in the lunar shadow, cyclic variations in thermal gradients across the V-antenna booms resulted in scissor-mode oscillations of the booms which did not occur when the spacecraft was in 100% sunlight. One consequence of this boom motion was a variation in antenna impedance that sometimes resulted in significant fluctuations in the apparent signal level - especially at frequencies near half- and full-wave resonance (i.e. ~ 737 and 1310 kHz.) This effect had a period of approximately 50 min (the scissor-mode period) and was most pronounced on the upper V-antenna during the first and fifth lunar shadow period (see Table 1) and on the lower V-antenna during the second and third lunar shadow periods.

Daily dynamic spectral plots were generated using BR-2 data in the following fashion. For every 10-minute interval of data, signal intensity distributions,  $N(I)$ , were calculated at each frequency by sorting the data in 1-dB bins. Then the values of the mean, minimum, and maximum signal levels as well as the mode (most common value) of the distribution were determined for each 10-min interval at each frequency. These data were used to generate four 24-hr dynamic spectral displays which showed the variation of the average, minimum, maximum and mode of the received noise as a function of frequency and time with 10-min resolution. The intensity scale was plotted in increments of 1 dB with respect to the average background level at

each frequency determined from studies of the long-term baseline level. The display format is illustrated and explained in Figures 3 and 4.

The dynamic spectral plots discussed above were generated from data contained on the RAE-2 Burst Receiver Ten Minute Summary Tapes. The contents and format of those tapes are described in Attachment 3.

#### Ryle-Vonberg Receivers

The RAE-2 Ryle-Vonberg receivers are designed to provide measurements which are relatively insensitive to gain and bandwidth changes. They operate at nine frequencies from 0.45 to 9.18 MHz. There are two receivers - RV-1 connected to the upper V and RV-2 connected to the lower V. The radiometers have an effective bandwidth of 40 kHz and a post-detection time constant of 0.1 second. A coarse output channel is obtained from the integrated servo-loop error signal, and a fine output channel is obtained from the noise source output required to match the antenna signal. (See Figure 5 for a block diagram of the Ryle-Vonberg receivers.) The time constant for the fine channel is 0.5 second. A thermistor located in the receiver measures the ambient temperature which is telemetered every 19.7 minutes in the housekeeping data. The center frequencies for the Ryle-Vonberg receivers are listed in Table 4.

Each frequency is selected for 15.4 seconds before stepping to the next. During this time, eight coarse and two fine samples are taken. Of the eight coarse samples, the first is not reliable since not enough time has elapsed for the receiver to stabilize since the frequency switch was made.

The data from the Ryle-Vonberg receivers are written on a tape containing 15 files with each file representing 4 days of data produced from the 24-hr tapes. The format of the tapes is described in Attachment 4.

Table 4. Ryle-Vonberg Receiver Frequencies

<u>Channel Number</u>	<u>Frequency (MHz)</u>
1	0.45
2	0.70
3	0.90
4	1.31
5	2.20
6	3.93
7	4.70
8	6.55
9	9.18

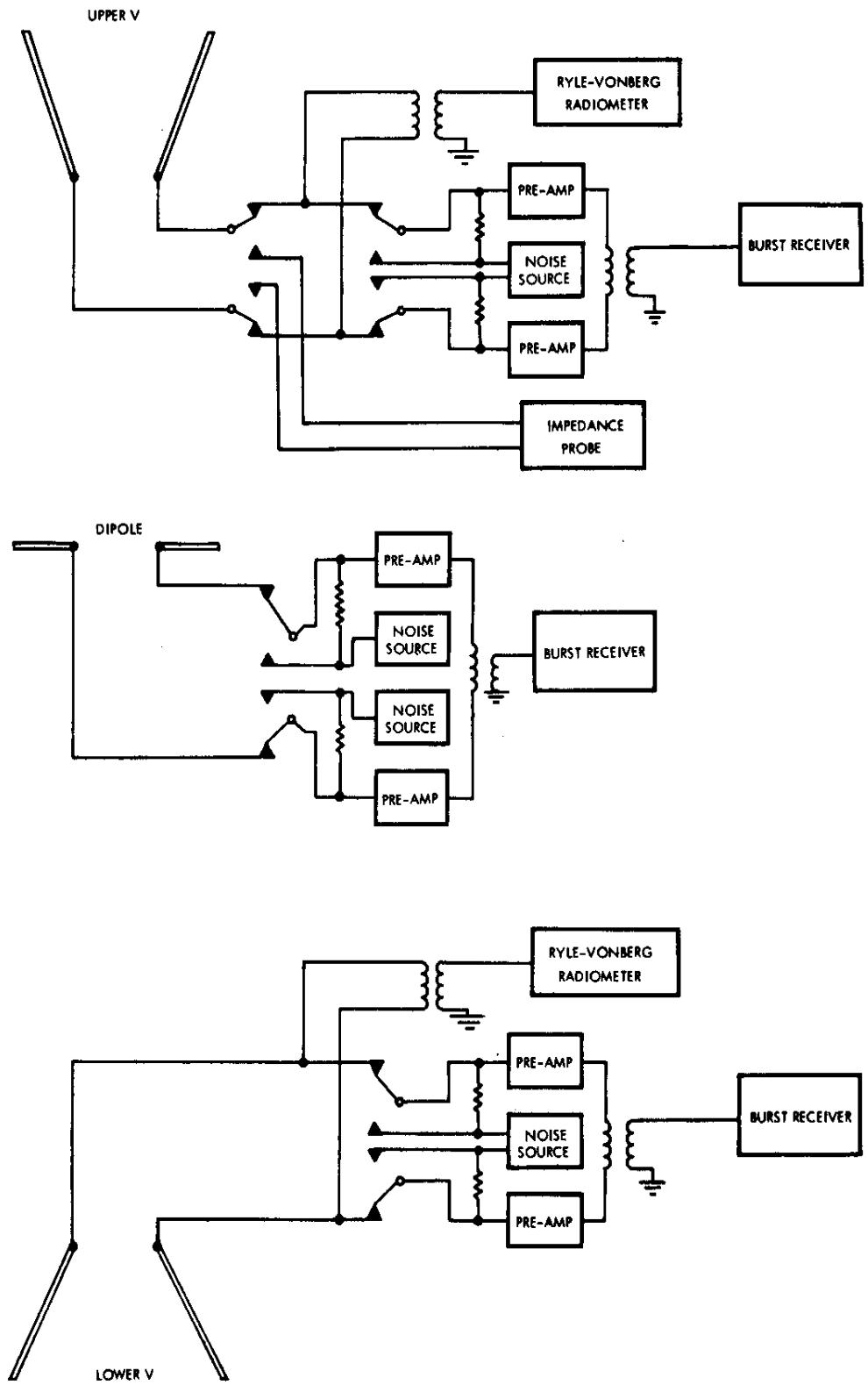


Fig. 1. Block diagram of RAE-2  
experiment instrumentation

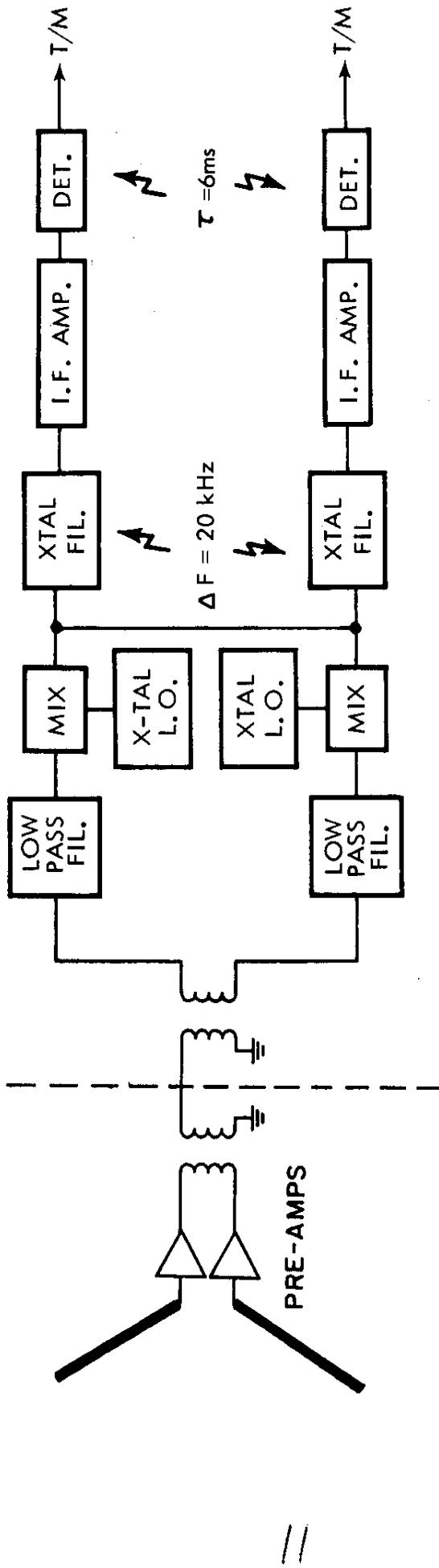


Fig. 2 Block diagram of the RAE-2 V-antenna burst receiver.

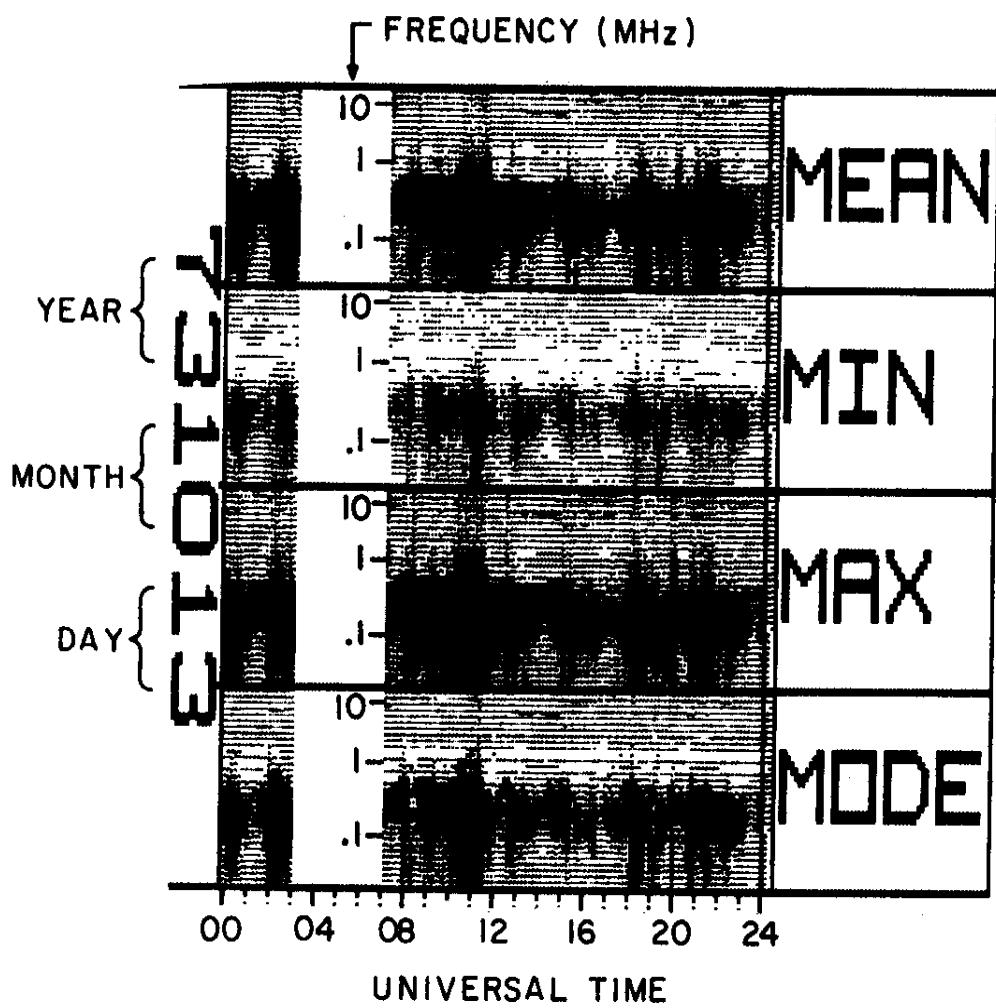


Fig. 3 Twenty-four-hour dynamic spectrum of BR-2 measurements illustrating receiver intermodulation effects due to intense terrestrial noise levels at frequencies near 0.3 MHz. The vertical "stripes" which appear to indicate strong wide-band signal levels (especially near 02-03 hr., 10-12 hr., 18-19 hr., and 21-22 hr. U.T.) are due to intermodulation effects in the pre-amplifiers.

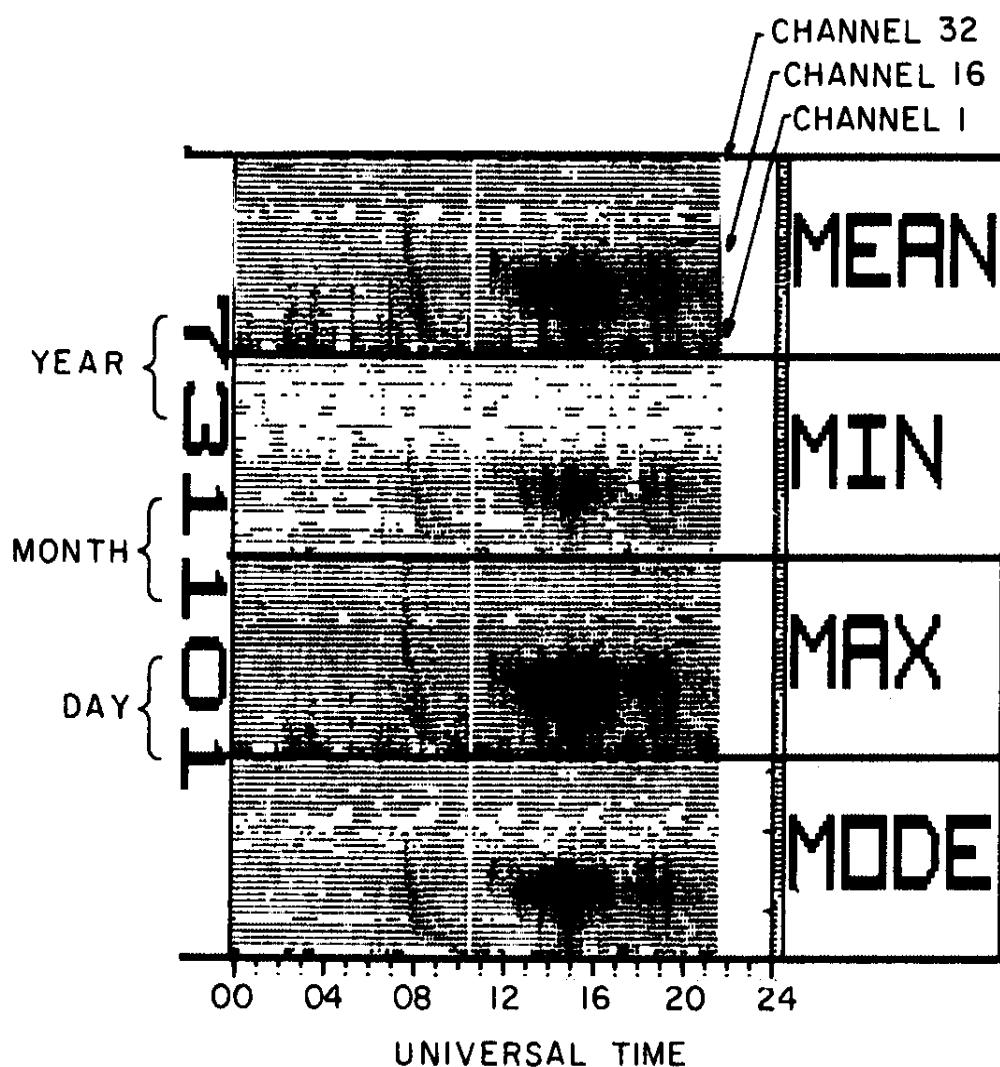


Fig. 4 Example of the 24-hr. dynamic spectral plots generated from the burst receiver ten-minute summary data tapes. Increasing darkness indicates increasing signal intensity. Note (1) some sporadic VLF noise bursts from the solar wind at frequencies below 100 kHz at about 02-04 hr. U.T., (2) a type III solar radio burst at about 08-09 hr. U.T., and (3) a terrestrial kilometer wavelength radio storm at about 13-17 hr. U.T.

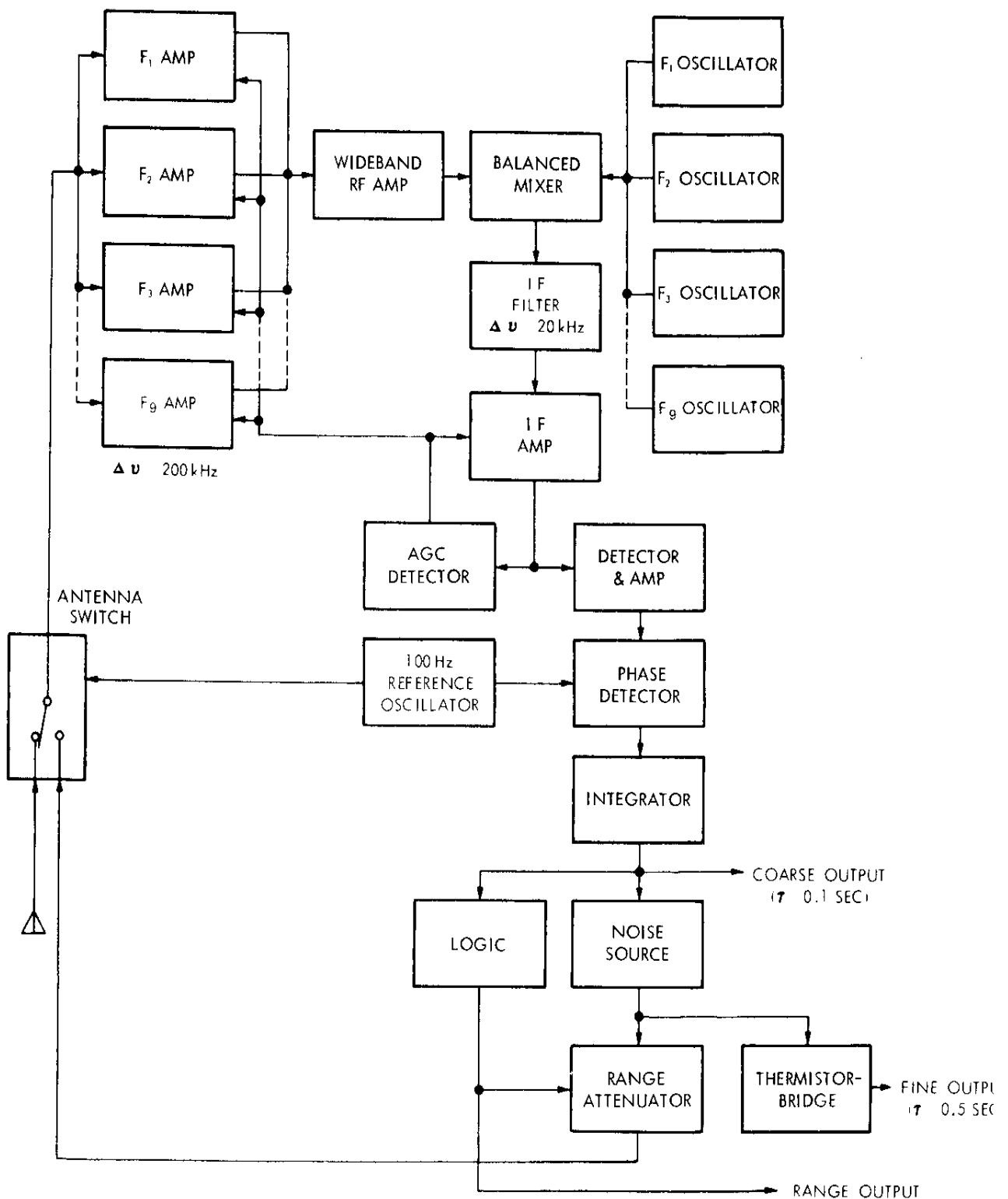


Fig. 5. Block diagram of RAE-2  
Ryle-Vonberg receiver

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## ATTACHMENT 3

TAPE FORMAT FOR THE RAE-2 BURST RECEIVER TEN MINUTE SUMMARY TAPES

EACH LOGICAL RECORD CONTAINS A SUMMARY OF TEN MINUTES OF DATA FROM THE BR-1 AND 2 RECEIVERS. THE TEN MINUTE INTERVALS ARE DEFINED TO START AT PRECISELY 0 HR ON EACH DAY. THE LOGICAL RECORD LENGTH IS 544 8-BIT BYTES + A 4 BYTE LOGICAL RECORD CONTROL WORD. THE PHYSICAL RECORDS ARE 32336 BYTES (=548\*59+4). THE TAPES ARE 9-TRACK 1600 BPI. EACH TAPE CONTAINS TWO CALENDAR YEARS OF DATA. THE INDIVIDUAL QUANTITIES IN EACH RECORD ARE

FORTRAN WORD #	TYPE	LENGTH BYTES	DESCRIPTION
1	I	4	DATE IN YYMMDD FORM (E.G. MAY 15, 1974=740515)
2	I	4	UT IN ELAPSED SECONDS FROM OHR AT THE START OF TEN MINUTE INTERVAL
3,4,5	R	4	LUNICENTERED X,Y,Z OF SPACECRAFT IN KM AT THE ABOVE TIME. THE X AXIS POINTS TOWARD 1ST POINT OF ARIES AND Z IS PARALLEL TO THE EARTH'S SPIN AXIS--THE SYSTEM IS PARALLEL TO GEOCENTRIC EQUATORIAL SYSTEM BUT TRANSPOSED TO THE MOON.
6,7,8	R	4	LUNICENTERED X,Y,Z OF THE EARTH IN UNIT VECTOR FORM AT THE ABOVE TIME

THE FOLLOWING SET OF 8 BYTES IS REPEATED FOR EACH FREQUENCY (IN THE SAME ORDER AS TABLE 3) FOR BOTH RECEIVERS (8\*32\*2=512 BYTES=WORD NOS. 9-136). THE 2% VALUES AND THE MODES WERE DETERMINED BY FORMING HISTOGRAMS (FOR EACH FREQUENCY AND RECEIVER) IN 1 DB INCREMENTS FROM THE INDIVIDUAL SAMPLES TAKEN DURING THE 10 MINUTE INTERVAL. THE HISTOGRAMS WERE THEN SCANNED TO FIND THE LOWEST BIN CONTAINING AT LEAST 2% OF THE TOTAL NUMBER OF SAMPLES, THE HIGHEST BIN CONTAINING 2% OF THE TOTAL, AND THE BIN CONTAINING THE MOST SAMPLES (MODE). IN SOME CASES, NO BIN CONTAINED AT LEAST 2% OF THE VALUES, SO A ZERO WAS WRITTEN ON THE TAPE.

TYPE	LENGTH BYTES	DESCRIPTION
I	1	NUMBER OF NON-ZERO SAMPLES DURING THIS TEN MINUTE INTERVAL FOR THIS FREQUENCY AND RCVR
I	1	2% MINIMUM IN DB ABOVE 1 DEGREE KELVIN
I	1	2% MAXIMUM IN DB ABOVE 1 DEGREE KELVIN
I	1	MODE (MOST COMMONLY OCCURRING VALUE) IN DB ABOVE 1 DEGREE KELVIN
I	2	$100 \cdot \text{ALOG}_{10}(\sum T_i)$ WHERE $T_i$ IS A SAMPLE
I	2	$100 \cdot \text{ALOG}_{10}(\sum T_i^2)$

THIS TAPE COULD BE READ AS FOLLOWS (IN IBM 360 FORTRAN IV):

```
LOGICAL*1 NUM(32,2),MIN(32,2),MAX(32,2),MODE(32,2)
INTEGER*2 SUMT(32,2),SUMTSQ(32,2)
READ(IUNIT) 1YMD,1SEC,XM,YM,ZM,XE,YE,ZE,
```

Attachment 3 p.2

```
1 ((NUM(I,J),MIN(I,J),MAX(I,J),MODE(I,J),SUMT(I,J),SUMTSQ(I,J),
2 I=1,32),J=1,2)
```

HOWEVER, A CHEAPER (IN CPU \$) METHOD USING EQUIVALENCE IS:

```
INTEGER*4 A(136)
INTEGER*2 SUMT(4,32,2),SUMTSQ(4,32,2)
LOGICAL*1 NMMM(8,32,2)
EQUIVALENCE (A(1),IYMD),(A(2),ISEC),(A(3),XM),(A(4),YM),
1 (A(5),ZM),(A(6),XE),(A(7),YE),(A(8),ZE),
2 (A(9),NMMM(1),SUMT(1),SUMTSQ(1))
READ(IUNIT) A
```

FOR NMMM USE ONLY ROWS 1,2,3,4 FOR NUM,MIN,MAX,MODE

FOR SUMT USE ONLY ROW 3

FOR SUMTSQ USE ONLY ROW 4

8

## ATTACHMENT 4

Tape Format for the RAE-2 Ryle-Vonberg 24-Hr tapes

Each tape contains 15 files of data, with each file containing 4 days of data. The files are in chronological order. The tapes are 1600 BPI, 9-track, IBM standard label tapes. The logical record length is 908 bytes, consisting of a 4 byte logical record control word and 904 data bytes. The physical record length is 31784 bytes long, consisting of a control word and 35 logical records.

Each logical record is formulated as follows:

Word #	Tape	Length (Bytes)	Description
0	I	4	logical record control word (to be ignored)
1	I	4	Date, YYMMDD
2	I	4	Milliseconds of day
3	I	4	Frequency where 9 = 9.18 MHz and 1 = 0.45 MHz, etc.
4,5,6	R	4	X, Y, z of spacecraft in km. X-axis points toward the vernal equinox, the z axis is parallel to the earth's spin axis
6,7,8	R	4	X, Y, z of earth's unit vector in lunicentered form
10, 11	R	4	Right ascension and declination (1950.0) of the upper V.
12-18	R	4	Seven RV-1 coarse samples
19-20	R	4	Two RV-1 fine samples
21-27	R	4	Seven RV-2 coarse samples
28-29	R	4	Two RV-2 fine samples
30-225			Repeat of words 2-29 eight times for the remaining sets of this frequency in this sequence
226	I	4	RV ambient temperature

*Attachment 4 p.2*

In IBM 360 Fortran IV, the tape could be read as follows:

```
REAL*4    A(226), RV(28,8)  
INTEGER *4    IRV(28, 8)  
EQUIVALENCE    (A(1), IYMD), (A(2), RV(1,1), IRV(1,1))  
READ (IUNIT) A
```

IEF2851 VOL SFR NOS= K3SCR3.  
 IEF3731 STEP /LINK / START 75225.1937  
 IEF3741 STEP /LINK / STOP 75225.1938 CPU 0WIN 01.455 SEC MAIN 130K LCS JK  
 - STEP 03 - RETURN CODE = 0000

```

XXGO EX EC > GM #LINK,SYSS,MOD,COND=(4,LT),REGION=700
XXFT05=001 DD CONNAME=DATA5
XXFT06=001 DD SYSOUT=ENUT,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=63,ESIZE)
IEF6531 SURSTITUTION JCL = SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7255)
XXSYSPRINT DD SYSOUT=60UT,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7280,LRECL=30)
IEF6531 SUBSTITUTION JCL = SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265),
XX GO. #T08F001- DD *NIT=(TRACK),DEFER=L43ELT,BLP,*IN)*DSPP=SHR,
// GO. #T08F001- DD *NIT=(TRACK),DEFER=L43ELT,BLP,*IN)*DSPP=SHR,
// GO. DATA5 DD *
  
```

IEF2361 ALLOC. FOR YZJRJMG1 G3
 IEF2371 232 ALLOCATED TO PGM=\*\*.DD
 IEF2371 231 ALLOCATED TO F105=001
 IEF2371 332 ALLOCATED TO F107F001
 IEF2371 332 ALLOCATED TO SYS2 INT
 IEF2371 231 ALLOCATED TO SYS2 INT
 IEF2371 232 ALLOCATED TO SYS2 INT
 IEF2371 003 ALLOCATED TO F103=001

		RECORD LENGTH = 32336 BYTES	
		1 OF FILE	2
Time			
75500000	02240000	00001C20 4322A1A2 C37F3330 C3745539 10C4BA64 C093A3D1 C02C7839	
24435E44	03D6076F	2A475249 039C0690 2A484=49 0391)637 0000000 2A424343 034905F4	
2A3F4540	032205FC	2A3F4741 033A05E2 2A3C4944 034F60F 2A3A534C 0389069E 2A445552 03CA0708	
2A4D5A54	03F20753	000C0000 2A4C5752 03DE72A 2A4B5355 03E9073B 2A45551C 03BA06E6	
2A444E4C	03B06683	2A3E4C47 0370064E 2A3E413F 032115A1 2A3D3E3E 03140586 2A3C3E33 03050568	
2A3C403D	03090572	2A3D403F 031D0599 2A3E413F 032105A2 2A3C3E3D 03060568	
2A3C3D3C	03010560	2A3C3F3D 03060569 2A385344 037A16A7 2A373339 02E30526 2A3C413D 03130587	
2A38413A	02F0560	2A353C39 0253052A 2A485*49 03#11734 2A43534A 03D90735 2A465548 03A406D9	
2A434744	035A0614	2A3F4341 0325058C 2A3D413F 032005A1 2A3B433F 03170597 2A394739 032E05D1	
2A385043	03720660	2A3A5449 03930653 2A4A7551 04A60943 2A195D54 03ED0766 2A495353 03D70731	
2A495953	03F90745	2A455449 0333062D 2A40449 037E0563 2A3B35045 0373066E 2A393339 02E7052E	
2A3A3D3A	02F20545	2A3B3C3C 02F055A 2A3C413D 03090573 2A3D3E3E 03080573	
2A3C3F3E	03130585	2A3S3B3A 02F053D 2A39333A 02E8052F 2A373A39 02E20524 2A35423A 02ED0552	
2A343936	02C804F0	2A373C39 02F40529 2A35413E 0301055F 2A313A33 02850405 02240533 0087215	
00001F78	432DB028	C36C1BAS C3337D40 C09D8BD C02C628F 44435145 039405AC 44455A47	
03FA079E	44454F46	03#707749 00000000 00000000 00000000 4440440 034*55E0 43D#23D 03300590 443P405F	
033405B2	443C3E3D	03200584 4437483A 033A051F 44361E3B 035C065C 4395523C 03A805D3 00000000	
01000003	44435351	03C106E7 4443504C 0336050B 443C04C 033B06A0 443C04C 03A93517 443A4F3C	
037F0676	443F483F	0363064A 44303F3E 0329059E 443B3D3C 03150574 443C3E3D 031B057F 443D403F	
032F05A7	443D3F3E	032A059D 443E403F 033505B4 443B3D3C 03170579 443B3C3C 03130573 443B3D3C	
0319057C	4439453D	03370524 443B3D3A 02F054C 443C403E 03270598 443A403A 03150572 44253C37	
02E70528	44485340	03E4075E 44475648 04370366 44444A45 03D30787 44414742 03630530 443D423F	
033805C0	443C403D	03240595 44343D33 030C0565 44393C3A 02F0547 443564739 03250524 44344A38	
0351063D	44374F3A	03870694 44385251 034*0500 44435249 03840509 44455149 03250539 443A4D47	
038C0630	44384E49	03330672 443A4C46 0378065E 44391539 032305CB 443A3E3B 030A0552 443B3C37	
03120567	443C3F3D	031F0587 44383E3D 031E0588 443D3E3E 0323053F 443D3F3E 032A059F 44393C33	
03370557	44383E3A	02FC0541 44393A39 02F60537 4437423A 03140584 44343B36 02E7051 44383C39	
02F8053D	44373E3A	030A0563 44313539 023A04C1 02B0000 001B7215 00002000 433E73B 341C501	
0396E029	44352E39	02C23D89 42D435044 038B072A 4D455047 04530888 4C45613 04530866	
00000000	00000000	4D404841 0330559 42D3D4054 03305A57 4D3FA03F 13520661 03250545	

RACF  
 73-C39A-C3B  
 11/15-3/9/26

RECORD LENGTH	384	OF FILE	2						
LENGTH	2196	BYTES							
03940000	02240000	00018965	00014F28	439FF19C	4340023C	C29F555F	BF51A6E1	C0FCB1E	C056CC5
43284128	022E0572	43292529	02570359	4358635B	0464082B	00000000	00000000	43464915	03780635
43454746	03760636	43444645	036D0624	43383A3A	02FA053E	432C342C	02850477	432C2C2C	0271042D
4348584F	03F5073F	00000000	00000000	43393E39	03080553	433C3E3D	031A057E	433C3E3D	031A057F
43323433	0289045B	43293024	02550421	432C2C2C	0272042E	43347544B	036E06F9	432C2C2C	0270042B
43383C39	03040559	433C3F3D	0320059A	433D3=3D	0322058E	43333534	02C504D3	432B322B	027C0455
432B2B2B	026A041F	434010767	432R2B2B	02650415	03404541	034C05E7	43454545	036F0628	
43444644	0369061C	433C3E3D	03190581	434A4=4B	03FA06AC	43484C49	03A30695	434448A6	03750637
43424945	03750662	433F544B	034E06ED	433F5240	03B106D1	4343584E	03D60721	43405550	03F10742
4334C592	03F7074E	434A5952	0400076D	43485651	03D60714	43435450	03CA06FD	43394E3A	036E0657
43354D38	03740573	43353A36	02F0A059B	43383>39	02F0054C	433A3D3C	031056A	43383338	02ED0525
43393C3A	02FC0544	433S3D3C	03170579	433C3J3D	031E0585	43344235	03D40588	433A453B	033A05EA
433D3F3E	03290599	433A3C33	03N9055D	43393A3A	02F00544	43393A3A	02FB0540	43353335	02B504F5
43343735	02D40514	43394541	03440523	43354337	031C05C5	43321C43	02870489	02240510	00B999F6
03000000	439919A5	4344DF27	432559F9	BF4B5A4F	C0F0C05	C056C77D	4D2B4137	0309057E	4D292929
025D03FF	4D586E5E	04R808F0	00000000	00010000	4D465748	032E5734	4D454847	0383064C	4D444745
03790636	4D39383A	03020549	402C332C	023A0478	4D2C2C2C	02770433	4D4C625D	04400301	00000000
00000000	4D3A463C	03C50784	403D3F3E	03290596	4D3C3F3D	0325J58F	4D323433	02C304CA	4D292F2A
026F042B	4D2C2C2C	02780435	4D4E5F4C	04C0979	4D2C2C2C	02760431	4D3A463C	03840526	4D3D3F3E
033105A6	4D303C059	032C33534	02D04DF	4D2B32B	02960452	4D2B2B2B	027B0425	4D4F6354	
0451081E	4D2B2B2B	02650413	4D414F44	4D454745	039F0643	4D444645	03750530	4D3E3E3D	
0324058D	4D4A754E	04B30951	4D4A94F4B	033306B2	4D444845	03770641	4D434744	03730530	4D425244
040406557	04290805	4D4E6151	046E08BD	4D4E7953	050309C3	4D4F7979	05439A32	4D526E6E	
04CF091C	04507952	05460A03	04F009AB	4D46564E	043D0979	4D384A47	037B0533	4C364136	
0309057C	4D383C39	03040542	04R808F0	00010000	4D465748	032E5734	4D3A403A	0310570	4D39403D
03160579	4D373D3D	03180575	4D38813B	023052B	4D3D403E	033405AD	4D393C33		
0300055D	4D383A3A	02F0543	4D343735	02D044FF	4D3A463C	026D052A	4D3394539	026D052A	4D3A4641

RECORD LENGTH	384	OF FILE	2						
LENGTH	2196	BYTES							
03210580	040384340	033E05C3	403F0547	4D383J3C	031A3573	4D3C3E3D	03230589	4D334533	032E05D7
040353835	02D0503	4D333735	03180573	4D393C3A	03080555	4D393B3A	0304054C		
02240478	43383A3A	0338055D	4D354438	4D323533	032F05C1	4D323533	02C504D0		
02E60551	43292929	02570359	4D354438	4D3669D3	04530882	00010000	02FB0540	055723	43284028
036A061E	43434746	03770631	43383A3A	02F0533F	4326332C	02350477	432C2C2C	0271042D	43434645
03B906FF	00000000	00000000	433A503B	039F0547	43323534	031F0569	433B3F3D	0310539	43303433
0249904B	43282F2A	02610415	432C2C2C	0272042F	4339539	03380555	432C2C2C	0270042B	4339553C
03A706E1	433A3D3C	03140572	433D03F3	03270599	43333534	022304D1	432B332B	0279041E	432B32B
026A041F	4337474D	03570779	432B2B2B	02550415	43415742	032D0758	43434544	03650515	43444645
036F062A	433B3D3D	031A057E	43492757	0505099C	43427769	04620968	43474454	04C90975	43405A41
046B98CD	433C513D	03C0753	431D4E45	03B0C054	433E553E	03170718	433B3338	0356051	4346574A
03C9070C	4337514D	042C0851	433A5148	03AF055E	43334F3A	03370685	43394B47	037C055A	43384E48
03206056	433A3D3C	030E0567	433A3D3D	03170579	43334534	0337J50D	433A4C3A	0367063F	4335403F
03990649	43365939	03940693	43383D39	035F0651	43394739	0338055D	43383038	0255052A	43394539
02CA04E1	43364639	03410621	43354239	030B057D	43323534	02C104CE	02245000	000B3975	00014CDD
433952E6	4337F3AF	C33AA513	BF580203	C0561F	4B284135	02F00567	4B292929	025C03F	
048546865	04800983	00000000	00020000	43475C48	042107E2	4B431545	0372062A	4B434515	03710627
48393B3A	03010548	4B2C322C	02890477	492C2C2C	02760432	4B485B4E	040F078D	00000100	00000000
4838503D	03B8073C	4B3B3D3C	03190578	4B3C3E3D	03200585	4B323433	02C004C6	4B2B302A	026C042A
4B2C2C2C	02770434	4B4A45743	035F0744	4B2C2C2C	02750433	4B3B3533	03B60700	4B3A353D	03100580
4B3D3F3D	03260592	4B3J3534	02C2R04D	4B2B32B	02710445	4B2B2B2B	025F0424	4B495F5A	04260789
026A041A	4E425B45	040000732	43444545	036F0522	4B434544	036E0621	4B445314	04BEE0979	
4B349754A	04CF5964	4B464A48	045608A9	43453046	040307DE	4B435645	046908CD	4B445314	
4B3F585A	040F078F	4B3E5B42	041507A9	4348544F	041A07C6	4B4A5752	03F90747	4B455951	03FD075
03DE0710	4B447534	03270629	4B434E4D	03A606A0	4B13504E	03BA06CB	4B395039	03AE0707	
4B384A3A	03590652	4B3A4953	03310663	4B3A3E33	02F0583	4B393D39	0301054E	4B3A3D3C	03160572
4B3A493A	03105057	4B3A493A	03340507	4B3D4033	036F0535	4B3D4033	033405AF	4B3A3D3C	03150570
4B393B3A	03079553	4B3A493A	030606552	4B3D3736	02B004FF	4B333834	02DB0508	4B384539	033F050C
49343C37	02FC0559	4B323433	023F04C4						

43373R3A	02F90541	43343C39	02E30512	43353B35	02CAJ501	433A7433	03530614	433A453E
43313A35	02DF0512	02240000	000999F6	00J004R0	4367743B	433A61AC	437B3FFC	BF3EE113
C056BC3	1510F28	02C40533	15292299	022503C0	136D7A71	053051FA	00000010	00000010
0458085X	15474C4C	0377066E	15424644	03335053	157373CA	02CB0514	152C342C	02690458
023F03FA	155F9464	05CA0P94	00000000	00000000	154D5C51	03D90750	153D4141	030B0595
02E30543	15323433	02280049C	152G2F2F	02529423	152G2C2C	024103FC	155B7965	04F1094E
023E03F3	15405550	03C30711	15414444	032705CD	153G3D0	02E9054F	15323634	02920442
02440416	15282B2B	023803EC	13538F86	05310342	152B2B2B	023303E2	15565D57	04067035
03840506	153F4140	03070593	15393F30	02750540	154C7373	04E4095F	153A7D5D	04893375
040A0739	153A5957	03E20744	153F5B52	03360745	15525B57	035A075C	15585F5B	04160732
0433077	15454545	033F05F3	15616161	04560320	15431343	032905CE	153D5B3D	03FA0790
02E20541	153A5A52	03CE0735	15465351	039F06CE	15371A48	031B0618	152F4744	03220520
0303059A	15354237	02E30579	152F2E29	202530423	15323D33	029494D8	15265262	02030332
02565043A	15264141	030A059A	15343F3C	02265429	15339C3A	02C95148	15393B3A	02B6513
02BF04FR	15363A38	02B904F1	15394943	032005DC	1538133A	02E65178	15353337	02AB0424

594 RECORDS IN FILE 2 JF TAPE

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IEF1421 - STEP WAS EXECUTED - CODE 0000 PASSED
IEF2851 VOL SER NOS= K3SCR3. SYSIN
IEF2851 SYS76225•T143212•RV000•YZJRJMG1•S000320 DELETED
IEF2851 VOL SER NOS= K3SCR2. VOL SER NOS= K3SCR2. SYSOUT
IEF2851 SYS76225•T143212•SV030•YZJRJMG1•R000317 DELETED
IEF2851 VOL SER NOS= K3SCR5. SYS76225•T143212•SV000•YZJRJMG1•R000318 DELETED
IEF2851 VOL SER NOS= K3SCR5. SYS76225•T143212•SV000•YZJRJMG1•R000319 DELETED
IEF2851 VOL SER NOS= K3SCR5. VOL SER NOS= K3SCR5. KEPT
IEF2851 JRJMP
IEF2851 VOL SER NOS= J0084. K-993,J,00-94,YZJRJMG1,63
IEF2851 STEP /GD / START 75225,1938 IO IN SECs. DISK= 6.85, RJM= .40, TAPE= .64, INS=(CPU=.33,IO=.31,CEL=.15
IEF3731 STEP /GD / STOP 76225,2023 CPU 0MIN 20.375EC MAIN 186K LCS 0K TIME=.40,TAPE=.11,85,CEL=.00,THR=.015
IEF3741 STEP /GD / RETURN CODE= 3000 IO IN SECs. DISK= 6.85, RJM= .40, TAPE= .64, INS=(CPU=.33,IO=.31,CEL=.15
IEF2951 SYS76225•T143212•RV000•YZJRJMG1•L00MOD DELETED
IEF2851 VOL SER NOS= K3SCR3. TOTAL TIME = 1.58 1INS=(CPU=.65,IO=.93)
IEF3751 J00 /YZJRJMG1/ START 76225,1856 1.55,TAPE=.35,91,CELL=.00,THR=.70
IEF3761 J00 /YZJRJMG1/ STOP 76225,2024 CPU TIME=20.23.59.03 DATE=08-12-76
IEF3761 SYSTEM=MVT-21 (11-21-73) <3 ID IN SECs. DISK= 18.35, RJM= 1.55, TAPE= 35.91, CELL=.00, THR=.70
THERE WERE 05 TAPES MOUNTED FOR THIS JOB. TAPE MOUNT CHARGE WAS 30.5 MINUTES.

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